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EXAMINER	
ROSARIO-VASQUEZ, DENNIS	

ART UNIT	PAPER NUMBER
2621	

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/020,031	GALLAGHER ET AL.	
	Examiner	Art Unit	
	Dennis Rosario-Vasquez	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 December 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 12/07/2001
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. In the IDS under other "OTHER ART" a reference titled "Digital Image Smoothing and the Sigma Filter" by Jong-Sen Lee was not received. Instead another document titled, " Digital Image Enhancement and Noise Filtering by Use of Local Statistics", IEEE TRANSAGIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE. VOL. PAM 1,2.NO. 2. MARCH 1980,JONG-SEN LEE was submitted. Please indicate which reference(s) to be included with the IDS.

Double Patenting

2. Claims 1-30 and provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1,4,5,6,9,10,17,19,23,24,25 and 26 of copending Application No. 10/016,601. Although the conflicting claims are not identical, they are not patentably distinct from each other because :

Claims 1-30 of the instant application are broader than the copending application's (No.10/016,601) claims 1,4-6,9,10 and 23-26 that contains all the elements of claims 1-30 of the instant application.

For example, claim 1 of the copending application No.10/016,601 contains the step of "applying the subject matter detector to the image to produce a belief map indicating the degree of belief that pixels in the image belong to target subject matter (claim 1, lines 5-7)" that can be found in claim 1, lines 4-6 of the instant application.

Another example, claim 9 of the copending application No.10/016,601 contains " wherein the image enhancement operation is sharpening" that can be found in claim 2 of the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1,2,5-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Savakis et al. (US Patent 6,738,494 B1).

Regarding claims 1 and 20, Savakis et al. discloses a method and system of improving a characteristic (fig. 2, num. 36: SHAPRNESS and fig. 12, num. 122 is a "noise reduction enhancement transform module" in col. 9, lines 8,9.) of an image according to its material content, said method and system comprising the steps of:

a) an image generator (Fig. 12, num. 110: IMAGE CAPTURE DEVICE) providing an image (fig. 2, label "IMAGE i") comprised of image pixels;

b) a material detector (fig. 2, num. 26 and 34 are detectors) generating a belief map (fig. 2, label "APPEAL BELIEF") corresponding spatially to the image pixels, wherein the belief map (fig. 2, label "APPEAL BELIEF") includes belief values (Fig. 2, num. 14:"classification stage" in col. 11, lines 57,58 outputs a likelihood or belief value ranging from 0-100 in col. 11, lines 54-60.) indicating the likelihood ("likelihood or belief" in col. 11, lines 58-60.) that respective pixels are representative of a particular material (Fig. 2,num. 20: flesh, fig. 2, num. 24: people);

c) a map analyzer (Fig. 12, num. 180:PROCESSOR ATTRIBUTE CONTROLLER) generating an improvement parameter ("processing attribute values P" in col. 8, lines 54-56.) from the belief values (Likelihood or belief values in col. 11, lines 54-60 are outputted from fig. 12, num. 10 to num. 180.) of the belief map (fig. 2, label "APPEAL BELIEF"), wherein the improvement parameter ("processing attribute values P" in col. 8, lines 54-56.) is proportional (The likelihood or belief values are compared to a number to output a corresponding attribute value in col. 10, lines 55-67.) to the belief values (Likelihood or belief values in col. 11, lines 54-60 are outputted from fig. 12, num. 10 to num. 180.) and applied uniformly to the image pixels; and

d) a processor (Fig. 12, numerals 122b and 122c are enhancement modules.) using the improvement parameter (The enhancement modules receive the "processing attribute values P" in col. 8, lines 54-56 from fig. 12, num. 180: PROCESSOR ATTRIBUTE CONTROLLER.) to improve the characteristic (fig. 2, num. 36: SHAPRNESS) of the image (fig. 1, label "IMAGE i").

Regarding claim 2, Savakis et al. discloses the method as claimed in claim 1 wherein the characteristic (fig. 2, num. 36: SHAPRNESS) is sharpness and the improvement parameter ("processing attribute values P" in col. 8, lines 54-56.) is a sharpening parameter (The processing attribute value P generated from fig. 12, num. 180:PROCESSOR ATTRIBUTE CONTROLLER is based on a sharpness characteristic outputted from fig. 12, num 10: IMAGE ASSESSMENT NETWORK. Note that fig. 12, num. 10: IMAGE ASSESSMENT NETWORK has a detail view shown in fig. 2 that has a sharpness characteristic 36.).

Regarding claim 5, Savakis et al. discloses the method as claimed in claim 1 wherein the characteristic (fig. 12, num. 122 is a "noise reduction enhancement transform module" in col. 9, lines 8,9.) is noise and the improvement parameter ("processing attribute values P" in col. 8, lines 54-56.) is a noise parameter (The processing attribute values P are generated within the noise reduction enhancement transform module in order to reduce noise.).

Regarding claim 6, Savakis et al. discloses the method as claimed in claim 5 wherein the step of using (Fig. 12, numerals 122b and 122c are enhancement modules.) the improvement parameter (The enhancement modules receive the "processing attribute values P" in col. 8, lines 54-56 from fig. 12, num. 180: PROCESSOR ATTRIBUTE CONTROLLER.) comprises performing noise reduction with a sigma filter ("Sigma filter" in col. 9, lines 9,10).

Regarding claim 7, Savakis et al. discloses the method as claimed in claim 1 wherein the step of generating (fig. 2, num. 15.1: BAYES NETWORK) a belief map (fig. 1, label "APPEAL BELIEF") comprises the steps of:

a) detecting (fig. 2,num. 12 is an extraction stage that detects pixels from an image.) pixels ("pixel values" in col. 6, line 50.) that represent the particular material (Fig. 2,num. 20: flesh, fig. 2, num. 24: people); and

b) producing (Fig. 2, num. 10 produces "APPEAL BELIEF) a belief map (fig. 1, label "APPEAL BELIEF") from the detected pixels ("pixel values" in col. 6, line 50.).

Regarding claim 8, Savakis et al. discloses the method as claimed in claim 1 wherein the particular material (Fig. 2,num. 20: flesh, fig. 2, num. 24: people) is selected from the group including faces (fig. 2, num. 24: people), flesh (Fig. 2,num. 20: flesh), sky and vegetation ("sky and grass" in col. 17, line 30) and the improvement parameter ("processing attribute values P" in col. 8, lines 54-56.) conditions the amount of improvement (The processing attribute values P are used to select a group of image enhancements in col. 8, lines 64-67.) upon a characteristic (fig. 2, num. 36: SHAPRNESS is determined as an attribute value P.) of the belief values (Fig. 2, num. 14:"classification stage" in col. 11, lines 57,58 outputs a likelihood or belief value ranging from 0-100 in col. 11, lines 54-60.) in the belief map (fig. 1, label "APPEAL BELIEF") that represent the particular material (Fig. 2,num. 20: flesh, fig. 2, num. 24: people).

Regarding claim 9, Savakis et al. discloses the method as claimed in claim 1 wherein the improvement parameter ("processing attribute values P" in col. 8, lines 54-56.) is proportional (Appeal "values ranking in the top quartile receive an image processing attribute value of 3" in col. 9, lines 1-6.) to a maximum belief value (Fig. 2, num. 14:"classification stage" in col. 11, lines 57,58 outputs a likelihood or belief value ranging from 0-100 in col. 11, lines 54-60. Note that the belief value of 100 is the maximum belief value.).

Regarding claim 10, Savakis et al. discloses the method as claimed in claim 1 wherein the improvement parameter ("processing attribute values P" in col. 8, lines 54-56.) is proportional (Appeal "values ranking in the top quartile receive an image processing attribute value of 3" in col. 9, lines 1-6.) to an average belief value (Fig. 2, num. 36 outputs an averaged value in col. 14, lines 14,15 to generate an appeal belief or belief value.).

Regarding claim 11, Savakis et al. discloses the method as claimed in claim 1 wherein the belief values (Fig. 2, num. 14:"classification stage" in col. 11, lines 57,58 outputs a likelihood or belief value ranging from 0-100 in col. 11, lines 54-60.) are grouped spatially into different sized regions of similar belief values (Savakis et al. states, "The size of the main subject is determined by the size of the high probability region(s) in the...main subject belief map (from col. 18, line 66 to col. 19, line 2).") and the improvement parameter ("processing attribute values P" in col. 8, lines 54-56.) is proportional (Appeal "values corresponding to a size ranking in the top quartile receive an image processing attribute value of 3" in col. 9, lines 1-6.) to the size (fig. 2, num.

32:SUBJECT SIZE) of at least one of the regions ("high probability region" from col. 18, line 66 to col. 19, line 2).

Regarding claim 12, Savakis et al. discloses the method as claimed in claim 1 wherein the belief map (fig. 2, label "APPEAL BELIEF") is generated from a low resolution version of the image (Savakis states," Spatial interpolation is the process of re-sampling a digital image to change the number of pixels contained in the digital images. An interpolation enhancement transform module 122 is employed in a digital image processor when the number of pixels contained in a digital image does not match the number of pixels expected by an image output device...(col. 10, lines 14-18)." Thus a digital image can be reduced to a lower amount of pixels or lower resolution using fig. 12,num. 122: ENHACEMENT TRANSFORM MODULE(s).)

Regarding claim 13, Savakis et al. discloses the method as claimed in claim 1 wherein the belief map (fig. 1, label "APPEAL BELIEF") is generated (The belief map is generated from a re-sampled image generated using the enhancement modules 122 of fig. 12.) from a sub-sampled ("re-sampling" in col. 10, line 12) version of the image (fig. 2, label "IMAGE i").

Regarding claim 14, Savakis et al. discloses the method as claimed in claim 1 wherein the image (fig. 2, label "IMAGE i") is a color image (Fig. 2, label "IMAGE i" .) comprised of a plurality of separate signal channels (R,G,B channels in col. 4, lines 58,59.) and the belief map (fig. 1, label "APPEAL BELIEF") is generated from a selected signal channel (A green channel is extracted in fig. 2,num. 36:SHARPNESS in col. 14,

lines 1-3 to output a sharpness value to create the belief map or APPEAL BELIEF of fig. 2.)

Regarding claim 15, Savakis et al. discloses a computer program product ("software program" in col. 4, lines 34,35) for performing the method claimed in claim 1.

Claim 16 has been addressed in claims 1 and 2.

Claims 17 and 24 have been addressed in claim 8.

Claims 18 and 23 have been addressed in claim 7.

Claim 19 has been addressed in claims 2 and 11.

Claim 21 has been addressed in claim 2.

Claim 22 has been addressed in claim 5.

Claim 25 has been addressed in claim 9.

Claim 26 has been addressed in claim 10.

Claim 27 has been addressed in claim 11.

Claim 28 has been addressed in claim 12.

Claim 29 has been addressed in claim 13.

Claim 30 has been addressed in claim 14.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Savakis et al. (US Patent 6,738,494 B1) in view of Gouch et al. (US Patent 5,682,443 A).

Regarding claim 3, Savakis et al. does not teach the limitation of an unsharp mask operation, but does suggest using a sharpening operation for modules 122 of fig. 12 in col. 6, lines 8-12.

However, Gouch et al. teaches a method wherein a step of using (Fig. 4, num. 32 and 36 are look up tables) an improvement parameter (U_C is an enhanced signal (col. 1, line 59) due to an unsharp masking operation described in col. 1, line 32-59.) comprises performing sharpening (U_C corresponds with equation "P" of column 1 which includes a sharp signal "S" in col. 1, line 54) with an unsharp mask operation (Equation "P" is an unsharp masking operation.).

Regarding claim 4, Gouch et al. discloses the method as claimed in claim 3 wherein the sharpening parameter (sharp signal "S" in col. 1, line 54) is a scale factor ("S" is multiplied by a weight "K" in col. 1, line 58 in equation "P".) used in the unsharp mask operation (Equation "P" is an unsharp masking operation.).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Savakis et al.'s teaching of sharpening using modules 122 of fig. 12 with Gouch et al.'s teaching of unsharp masking, because Gouch et al.'s teaching sharpens "edges and enhance fine detail by means of unsharp masking (USM) (col. 1, lines 10,11)."

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Luo et al. (US Patent 6,282,317 B1) is pertient as teaching a method detecting features and determining the probability of the features using a belief map as shown in fig. 2.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario-Vasquez whose telephone number is 703-305-5431. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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